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SEVERAL EXPERIMENTAL TRIALS  
AT THE KANAZAWA INSTITUTE OF TECHNOLOGY LIBRARY CENTER  
USING ITS ONLINE SYSTEM

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1. Introduction

Kanazawa Institute of Technology Library Center (KIT-LC) was established in June 1982 with the aim to collect one million books and ten million informations such as theses, reports, etc. For the construction and realization of the LC keen attentions were paid and numerous attempts were made to establish an ideal technological special library in Japan. In other words the KIT-LC is in fact an experimentation in Japan as exemplified in the following seven points:

(1) KIT-LC basically has four functions, namely the educational center and the research center, which are self-evident at any university libraries, the center for the graduate students and the center for local technological informations.

(2) Implementation of the subject librarians system utilizing the present KIT professors.

(3) Subject librarians, who are teaching staff as well as librarians, are assigned with responsibilities of library user education.

(4) By utilizing the progressive computer system in KIT, online library system was introduced and thereby realized the form of cardless library.

(5) Through this online system all users can search the address of any documents in the library.

(6) In addition to the IR function this online system can be utilized as an integrated online library information system that handles almost all types of library operations, including acquisition, cataloging, circulation etc.

(7) In Japan the bibliographic informations are expressed mainly by two types of letter, Japanese and alphabetical letters. Based on this concept, development of the multilingual system is assumed to be possible. This means that the system can handle not only Kanji, two kinds of Kana and Roman script etc. but can also handle such script as the Arabic letter. This is currently under research by the staffs in KIT.

A more detail description of the above seven functions are presented in this paper.

## 2. Four basic functions of the KIT-LC

As far as KIT-LC is a library at the university, it is very obvious, that it has the following two functions, namely the educational center and the research center. However these are not simple functions, as it includes the AV(Audio-Visual) corner and the LL(Language-Laboratory) corner and can handle not only information in the form of books but also Audio-Visual type of information. It also has the CAI(Computer Assisted Instruction) classrooms for the students' selflearning with more than 140 terminals, the largest in Japan. Furthermore many little class-rooms for seminar education are provided on each floor of tower building and are arranged around the technological and academical documents, in order to organically connect the faculties and library information. Various trials are carried out by the KIT-LC also as a research center: Collection of technological informations, mainly domestic and foreign periodicals, are available for researchers. Furthermore a system has been established to carry out mutual corporation with other informational organization. The researches are also offered the services of utilizing the data base informations. These foregoing functions are highly motivated and experimental and is the first trial in the university library of Japan.

In addition to the services for the students and the professors the KIT-LC provides services for the graduate students, to assist in maintaining their modern technological level. Services will be offered by means of

telephone, telex and facsimile not only on technological information but also on other general information for their social activities.

As the fourth function the KIT-LC offers technological information services for promotion of community culture, local industry and other local activities.

Fig.1

Four basic functions of the KIT-LC

- 1) educational center
  - CAI (Computer Assisted Instruction)
  - AV (Audio Visual) education
  - LL (Language Laboratory) education
  - seminar education
  - user education
- 2) research center
  - technical periodicals corner
  - mutual corporation with other information centers
  - data base information retrieval
- 3) center for the graduate students
  - life-long-learning
  - service by telephone, telex and facsimile
- 4) local information center
  - service for community culture,
  - local industry and other local activities

3. Subject Librarian System at the KIT-LC

Subject Librarians (SL) are faculties with special type of librarian mission. And these functions includes book selection at the library. Because SLs are also professors, they should have the latest and most advanced information in his field. So they therefore must continue to keep abreast with informations and documents available in their professional field. (At the present time we have 11 SLs and their professions are as shown on the Figure 2.) This system of SL is a modified version of the Subject Specialist in the European or American university library, and is the first of such systems in Japan. The Subject Librarians are required to learn about library science and are also responsible for library users education.

Fig.2

The present SLs' professions

- 1) mechanical engineering
- 2) electrical engineering



- 3) industrial engineering
- 4) civil engineering
- 5) architecture
- 6) electronics
- 7) data-processing science
- 8) natural science
- 9) human and social science
- 10) English
- 11) German

#### 4. KIT-LC as a Cardless Library

KIT-LC is the first university library in Japan with full automation. Installation of this automated system was possible because the KIT had a computer center established earlier which facilitated the utilization and research activities necessary for the establishment of the Library Center. Another factor that contributed to the establishment of the automation system in the LC is the early acquisition of the Japan-Marc prepared by the National Diet Library of Japan. This permitted the KIT to study the utilization and application in the early stage of planning for the KIT-LC.

The first step taken was to convert all card type catalogues of the holdings in our library into the marc form which is referred to as the KIT-Marc. Consequently, all card catalogues were discontinued and the information in the library are now retrieved solely through the online terminals. All freshmen of KIT are required to take the course on theories and operations of computer system. This training will be further supplemented by the subject librarians who will provide detail training on the operation of the terminal devices and on the utilization of the library.

KIT's online IR system is a subsystem of the library information system of KIT(LINKIT). LINKIT-IR system has the following four types of menu: The first is the function that has been hitherto fulfilled by the card form catalogues. The second is the KWIC(key word in context) IR for the books in the Library Center. This system has three logical operators (AND, OR, and NOT) and four prefixes (Title, Author, Subject and Classification) and also some range-specification (Year published, Possession, etc.) The system's command codes and the command system was designed to conform with the ISO-Proposal.(see Fig.3) The third is the IR for all data of the Japan Marc. Any data under Japan Marc that is shown as a duplicate of the information stored in the library Center will be processed under the second menu. The fourth is the IR of the serials in the KIT-LC and the methods used for retrieval and the command system are similar to that of the second menu with few exception.

Through these online retrieval systems the users of the library will be able to obtain information on all documents in the library to include the actual location of the information and the current status of the lending. All lending functions are also automated.

Fig.3

#### Command codes system of the LINKIT-IR

Command code	Abridged form	Function
BEGIN	B	beginning of the IR session
END		ending of the IR session
FIND	F	creating a set of documents
LIST	L	choosing some documents from already created documents set
SHOW	S	showing the detailed information on a specific document
EXPAND	EX	giving the list of key words based on right truncation
HISTORY	H	giving the history of past questions
EXEC/PROF	EX/P	executing the IR program filed in the system
MODE		changing the mode of letter for input or output
OFF		ending of the total session

#### 5. Document addressing system

One characteristic of the document addressing system of LINKIT is that it provides information on the actual location of all documents in the Library Center. First advantage of this document addressing system is that, as a cardless library, all documents in the library may be freely arranged and that regardless of the location of the document, the online terminal can be used to search the address of these documents. The Library Center is a technological special library and therefore, the users are mainly professors or students of KIT. Careful studies were

conducted mainly by the members of the subject librarians on the most practical and convenient arrangements of the documents for the users and decisions were made as shown on figure 4. It is premature at this time to draw a conclusion that this new arrangement is successful, however, we can safely say that this is a new trial for a technological special library.

Fig.4

How to arrange the documents  
on the subject-divided floors  
at the KIT-LC

- 2F. the floors for the fundamental culture
- 3F. the floors for the research  
(periodicals, serials)
- 5F.-9F. the floors for the technology
  - 5F. 1: information science
    - computer science
    - 2: industrial engineering
    - management engineering
  - 6F. 1: electrical engineering
    - 2: electronics
    - communication engineering
  - 7F. 1: mechanical engineering
    - 2: industrial chemistry
    - chemical engineering
    - 3: resources engineering
    - energy engineering
  - 8F. 1: dynamics
    - applied dynamics
    - 2: building engineering
    - 3: materials engineering
    - processing engineering
  - 9F. 1: environment engineering
    - civil engineering
    - 2: architecture
    - designing

#### 6. LINKIT, an integrated library information system

The library information system of KIT (LINKIT) is not solely an online retrieval system, but, as mentioned in Chap. 1, is an integrated online library information system that handles general library operations including acquisition, cataloging, circulation, etc. (see Fig. 5)

In order to explain this system it is necessary to refer to the specific structure of the Japanese texts and its peculiarities in the computerization. The complicated Japanese text consists of KANJI and two types of KANA.



Foreign words are expressed, as a rule, in one type of KANA but the original foreign letters are used at times. Furthermore, the KANJI usually has two or more ways of reading. With such complicated Japanese texts, a specific device must be used for computerization. For this reason a special file arrangement as shown in Fig. 6 was invented by the staffs of KIT.

The coded information segment (1) contains such coded information as the KIT bibliographic number (the coded key), ISBN, date of publication, type of material, NDC (Nippon Decimal Classification) number, etc. The K-text segment (2) contains textual information such as the title, author name (s), publication information, etc. The 16-bit KANJI coding system is used only in this segment. The 8-bit KANA-EBCDIC coding system is used in all other segments. E-text segment (3) contains same pieces of information as in (2), but in the 8-bit KANA-EBCDIC system (yomi, when the texts are in Japanese). The access-point segment (4) contains search terms in KANA, or in roman English when the material is non-Japanese. The holding control segment (5) contains the holding control information, such as the number of copies available, the reservation status, etc. The holding information segment (6) contains the call number, the location code, the charge-out status, etc., for each copy of the material.

The online processing system designed on the bases of afore mentioned file arrangement has ten more menus as shown on Fig. 7. In case of circulation, the ID numbers of the readers and the lent documents are obtained through the bar-code scanner. The data arrangements for the periodicals are basically similar to that for the books in the Library Center. The LINKIT system is an integration of this online processing system and the retrieval system and both systems are designed to handle the peculiarities of the complex Japanese text.

Fig.7

The main menues provided by  
processing system of LINKIT

- 10 process of book lending and return
- 11 checking and updating the users current status
- 12 lending reservation and its cancelation process
- 13 updating operations on the adress of a document
- 14 checking operations on the location of documents on a book shelf
- 15 updating the information on a book shelf when documents are rearranged
- 16 registration and updating the bibliographic information
- 17 registration and updating the holdings information



- 18 checking the information on the traders concerned
- 19 registration and update of the information on received periodicals
- 20 management operation of basic information on the periodicals

## 7. LINKIT as a multi-lingual information system

As previously pointed out, Japanese documents contains many types of letters for example KANJI characters, KANA alphabets, Roman alphabets, Latin, and others. There are about 50,000 KANJI characters of which about 6,700 are commonly used and two types of KANA alphabets. In order to process these different types of letters, a 16 bit coding system mixed with 8 bit coding system, is used. As the result the LINKIT system currently is capable of processing not only Japanese characters, Roman alphabets, and Latin letters but can also handle Cyrillic and Greek alphabets (both capital and small letters). See figure 8. This indicates that the LINKIT system can also process other foreign letters. Research is close to completion by the staffs of KIT on the handling of Arabic letters. In other words, the LINKIT system using the 16 bit coding system is basically a multi-language system. Processing of multi-language with an 8 bit system was not possible. There is a prospect of making a multi-language system by using one of the many 16 bit KANJI terminals now sold in the market of Japan with some modifications. In this respect, the KIT-LC LINKIT system may be of some contribution to the development of the future multi-language computer processing system.

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Figure 8 An example of non-roman bibliographic records in LINKIT.

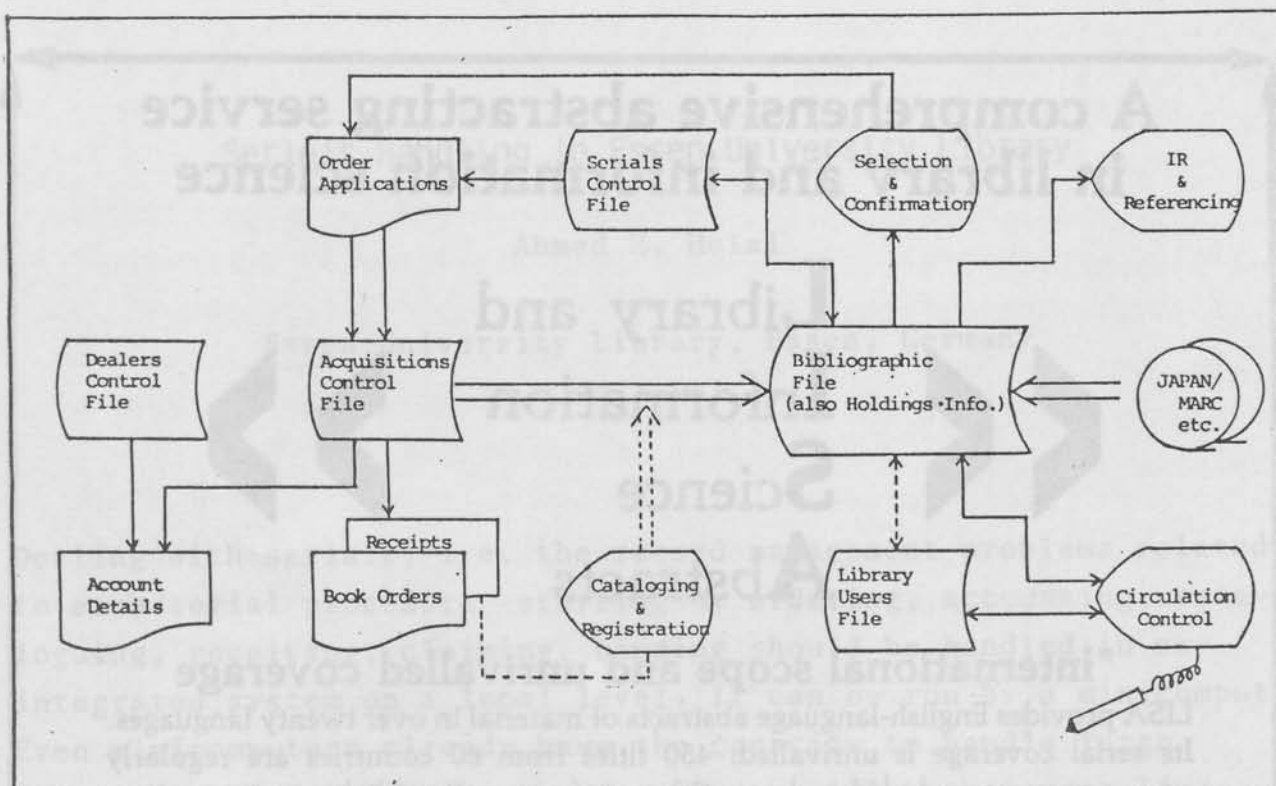


Figure 5 Schematic view of LINKIT files and functions.

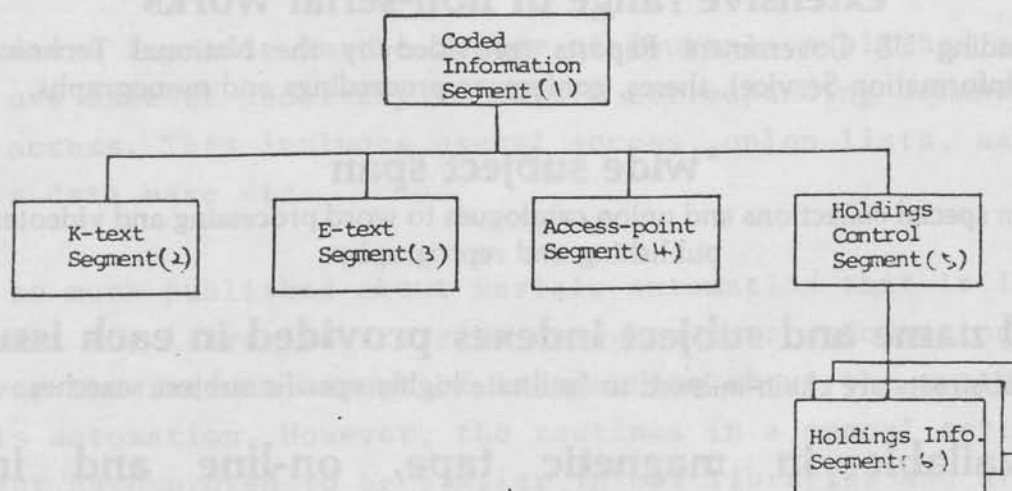


Figure 6 Data structure in the LINKIT bibliographic file.